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FOREST SURVEY RELEASE NO. 28

SEPTEMBER 25, 1937

POLE AND PILE TIMBER IN THE PINE-HARDWOOD REGION - WEST

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A Progress Report

by

THE SOUTHERN FOREST SURVEY

I. F. Eldredge

Regional Survey Director

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E. L. Demmon, Director

New Orleans, La.

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FOREWORD

The nation-wide Forest Survey, being made by the United States Forest Service, was authorized by the McSweeney-McNary Forest Research Act of 1928. Its five-fold object is: (1) to make an inventory of the present supply of timber and other forest products, (2) to ascertain the rate at which this supply is being increased through growth, (3) to determine the rate at which this supply is being diminished through industrial and local use, windfall, fire, and disease, (4) to determine the present requirement and the probable future trend in the requirement for timber and other forest products, and (5) to correlate these findings with existing and anticipated economic conditions, in order that policies can be formulated for the effective use of land suitable for forest production.

In the South, the Forest Survey functions as an activity of the Southern Forest Experiment Station with headquarters at New Orleans, La.

This release contains Forest Survey data that will be included in complete reports to be published later. It should therefore be regarded as a progress report. Although considered reliable, the data are subject to correction or amplification as the work of computation proceeds.

Staff Assignment

In Charge of Field Work and Preparation of Report
James W. Cruikshank - Associate Forest Economist

In Charge of Computations
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POLE AND PILE TIMBER

IN THE PINE-HARDWOOD REGION - WEST

This report gives an estimate of the quantity and sizes of pine timber that the timber estimators of the Survey considered suitable for conversion into poles and piles, in the seven Survey units of the pine-hardwood region west of the Mississippi River. The relative location and extent of these units, whose combined acreage amounts to about 48 million acres, is shown in figure 1. Over 31 million acres support some form of forest growth, mostly rapid-growing second-growth pines. Shortleaf is the most abundant pine species in the area, with loblolly a close second. Longleaf is confined almost entirely to southeast Texas and southwest Louisiana. Various species of hardwoods, chiefly oaks and red gum, are scattered throughout most of the pine stands. Along the Coast, between Houston and Lake Charles, a belt of flat and poorly drained land extends 40 to 50 miles inland. Northward from these flat lands the country becomes increasingly higher and more rolling, attaining the highest elevations and most rugged topography in the Ouachita Mountains of Arkansas and Oklahoma. About 73 percent of the area is in uplands, 15 percent in flatwoods and swamps, and 12 percent in river bottoms.

A network of railroads covers the area, with the exception of the Ouachita Mountain region, where rail facilities are more limited. Houston, Beaumont, Port Arthur, and Lake Charles have port facilities and are available to ocean-going vessels as well as to barges on the Intracoastal Canal. Roads, ranging from well paved Federal routes to Civilian Conservation Corps truck trails, form an extensive communication system that serves the entire area. Poles and piles can be transported to shipping points from all parts of the region.

In June 1937, 18 wood-preserving plants were located within the area, distributed as shown in figure 1. In addition, plants in Oklahoma at Oklahoma City and Hugo, in Texas at Denison and Somerville, and in Arkansas at North Little Rock secure a large proportion of their supplies from the pine forests adjacent to them. Considerable quantities of untreated poles and piles are also shipped from this area to treating plants in the Middle West.

The estimates given here include the total number of trees that were considered suitable for pole and pile timber, but it cannot be expected that all will be actually available for use by the pole industry. In 1934 there were about 1,500 sawmills cutting timber in the region, or one mill to every 21,000 acres of forested land. Through increased production of these mills and the addition of new mills, the lumber cut in 1936 exceeded that in 1934 by at least 60 percent. There are 9 pulp mills now operating in this area, and 3 more are proposed for construction in the immediate future. With the sawmills, pulp mills, and miscellaneous industries creating an increasing demand for raw material, it is evident that pole buyers must meet an increasing competition for their supplies. There is, however, a growing tendency for the pulp companies and larger lumber companies to segregate materials for special uses and market them where a greater profit can be obtained.

Where a relatively higher value exists for trees suited for poles or piles, pulpwood contractors and lumber operators will probably continue to reserve such trees for this market.

When using the following data, it is to be remembered that, owing to the sampling method used in collecting them, the greater the area or volume in any given classification the more accurate are the data for that classification. Figures for classes of infrequent occurrence and small quantity should be considered only as an indication of the relative abundance rather than as an accurate measure of the quantities involved.

Land Area

Of the 48 million acres included in the seven units that comprise the Pine-Hardwood Region—West, 65 percent, or over 31 million acres, are in forest land. Table 1 shows the relative proportion of forest and non-forest in the land area of each Survey unit.

Table 1. -- Land area of each Survey unit, classified according to forest and non-forest area

Unit	Total area	Non-forest area	Forest area 1/	Percent forested
		Acres		
Texas #1	9,893,800	3,272,600	6,621,200	66.9
Texas #2	8,622,100	4,675,900	3,946,200	45.8
Louisiana #3	5,774,200	1,230,700	4,543,500	78.7
Louisiana #5	6,142,000	2,300,300	3,841,700	62.5
Arkansas #3	8,931,900	2,826,700	6,105,200	68.4
Arkansas #4	4,917,700	1,539,200	3,378,500	68.7
Oklahoma #1	4,026,200	1,065,200	2,961,000	73.5
Total	48,307,900	16,910,600	31,397,300	65.0

1/ Includes 40,600 acres of nonproductive forest land.

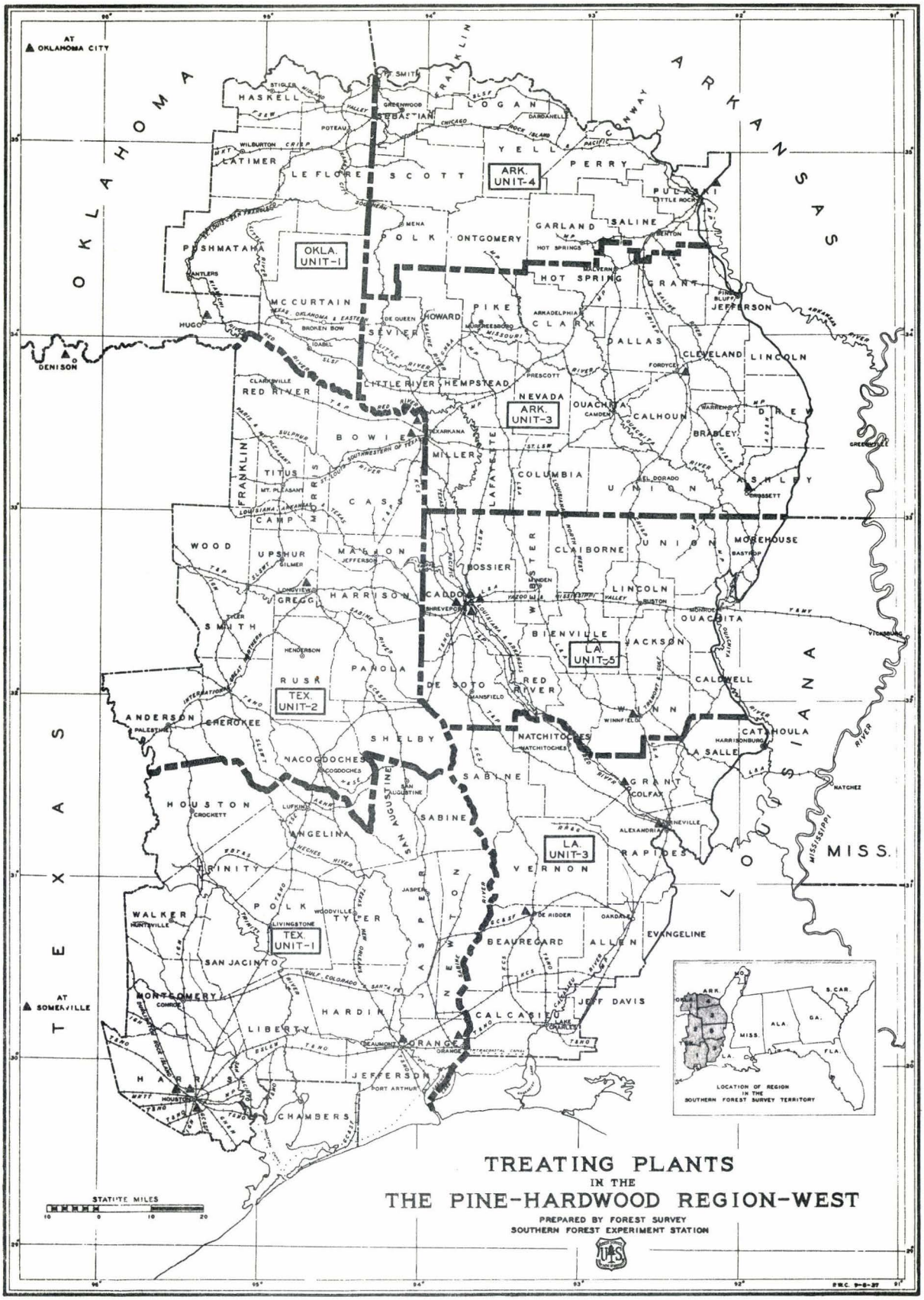
AT OKLAHOMA CITY
OKLAHOMA
ARKANSAS
TEXAS
LOUISIANA
MISS.
DENISON
AT SOMERVILLE
OKLA. UNIT-1
ARK. UNIT-4
ARK. UNIT-3
TEX. UNIT-2
TEX. UNIT-1
LA. UNIT-5
LA. UNIT-3
HASKELL
LATIMER
LEFLORE
SCOTT
LOGAN
YELL
PERRY
PULASKI
LITTLE ROCK
POLK
MONTGOMERY
GARLAND
SALINE
HOT SPRING
GRANT
JEFFERSON
PUSHMATAHA
MCCURTAIN
HOWARD
PIKE
CLARK
DALLAS
CLEVELAND
LINCOLN
SEVIER
LITTLE RIVER
HEMPSTEAD
NEVADA
OUACHITA
CALHOUN
BRADLEY
DREW
RED RIVER
BOWIE
MILLER
COLUMBIA
UNION
ASHLEY
FRANKLIN
TITUS
CASS
CAMP
MORRIS
WOOD
UPSHUR
MARION
BOSSIER
CLAIBORNE
MOREHOUSE
HARRISON
CADDO
LINCOLN
GREGG
SMITH
WEBSTER
OUACHITA
BIENVILLE
JACKSON
PANOLA
DE SOTO
RED RIVER
CALDWELL
RUSK
ANDERSON
CHEROKEE
SHELBY
NATCHITOCHES
CATAHOULA
LA SALLE
NACOGDOCHES
SABINE
GRANT
COLFAX
HOUSTON
ANGELINA
SABINE
RAPIDES
VERNON
TRINITY
WALKER
POLK
TYLER
BEAUREGARD
ALLEN
EVANGELINE
SAN JACINTO
JEFF DAVIS
HARDIN
CALCASIEU
LIBERTY
ORANGE
JEFFERSON
CHAMBERS
STATUTE MILES
LOCATION OF REGION IN THE SOUTHERN FOREST SURVEY TERRITORY
TREATING PLANTS
IN THE
THE PINE-HARDWOOD REGION-WEST
PREPARED BY FOREST SURVEY
SOUTHERN FOREST EXPERIMENT STATION

Figure 1.

Forest Area

The productive forest area of each Survey unit is classified by forest type-groups in table 2. Each type-group is designated by the predominant species of the forest association. The longleaf type-group occurs chiefly in Texas Unit #1 and Louisiana Unit #3, but a very limited area of this type-group in Louisiana Unit #5 is included with the shortleaf-loblolly type-group. The highest proportion of pure shortleaf-loblolly stands is found in the Arkansas units.

Table 2. -- Productive forest area classified according to forest type-group 1/

Unit	Longleaf	Shortleaf-loblolly	Shortleaf-loblolly-hardwoods	Upland hardwoods	Bottomland hardwoods	Total
			Acres			
Texas #1	931,400	2,309,200	1,668,800	484,500	1,215,600	6,609,500
Texas #2	-	1,484,300	862,800	937,800	658,200	3,943,100
Louisiana #3	1,962,200	878,600	633,800	291,600	775,700	4,541,900
Louisiana #5	-	1,446,100	1,126,300	477,200	776,800	3,826,400
Arkansas #3	-	2,184,300	1,772,000	865,500	1,276,100	6,097,900
Arkansas #4	-	1,563,300	803,300	901,600	108,700	3,376,900
Oklahoma #1	-	697,500	686,300	1,344,700	232,500	2,961,000
Total	2,893,600	10,563,300	7,553,300	5,302,900	5,043,600	31,356,700
Percent of total	9.2	33.7	24.1	16.9	16.1	100.0

1/ Does not include 40,600 acres of nonproductive forest land.

Pole and Pile Estimates

The following tables show the total number of pine trees that were considered suitable for use as poles or piles. No estimate is given for cypress or for any of the hardwood species. The greatest number of these pine trees is found in the shortleaf-loblolly and shortleaf-loblolly-hardwood type-groups, since these are the most extensive type-groups in the region, but some suitable trees occur in the other type-groups, particularly in the longleaf stands. In all of the type-groups the trees occur scattered throughout the forest, either as single trees or in small groups. Although of little practical significance, an idea of the relative abundance of pole timber in the various units can be secured by dividing the total number of poles in a given unit by the total number of acres in the pine types of that unit. Such a calculation shows, for example, that Texas Unit #1 averages 7.2 poles per acre, Arkansas Unit #3 averages 6.9, and Oklahoma Unit #1 averages 2.9 trees per acre, while Louisiana Unit #3 averages only 2.6 trees per acre that can be considered suitable for poles or piles. If the extensive area of clear-cut land in Louisiana Unit #3 is excluded, there is an average of 3.9 poles per acre on the forested land of this unit.

The estimates given in these tables are believed to be conservative. It is recognized that it is exceedingly difficult to appraise accurately standing trees as to their ability to meet the pole and pile specifications. This difficulty, combined with conservatism on the part of the Survey crews, has resulted in an estimate that may be too low; but the proportion of lengths and sizes occurring in the stands, and the relative abundance of pole timber by units, is correct and has a distinct value to the pole industry.

The total number of trees suitable for poles or piles in the seven units of the Pine-Hardwood Region—West, as shown in table 3, amounts to 120,450,000. Nearly 40 percent of these trees are found in Texas Units #1 and #2, with Arkansas Units #3 and #4 containing an additional 36 percent. Louisiana Units #3 and #5 contain 21 percent, with Oklahoma Unit #1 containing the remainder, or slightly over 3 percent. A large proportion (69.1 percent) of the trees are suitable only for the 20- and 25-foot poles, 24.4 percent will produce 30- and 35-foot lengths, while 6.5 percent can be utilized for poles or piles 40 feet and over in length.

The number of trees suitable for poles and piles in each individual unit is shown in tables 4 through 10, in which the trees are classified by pole and pile length, as well as by tree d.b.h. outside bark. Among the several units there is a marked difference in the number of suitable trees, depending upon the forest area of the unit and the quality of the standing timber. Texas Unit #1 ranks highest in number of suitable trees, and Oklahoma Unit #1 lowest (figure 2). In all of the units, the proportion of trees in the various length- and d.b.h.-classes is rather uniform. The number of trees in the 20- and 25-foot length-classes varies from 61 percent in Louisiana Unit #5 to 81 percent in Arkansas Unit #4. There were no trees recorded above the 35-foot length-class in Oklahoma Unit #1, while in Louisiana Unit #5, 10 percent were above this class. The 30- and 35-foot length-classes make up from 17 percent of the pole stand in Arkansas Unit #4 to 29 percent in Louisiana Unit #5. The two mountain units, Arkansas #4 and Oklahoma #1, are characterized by a high proportion of shorter and smaller trees.

Table 3. -- Total number of pine poles or piles, classified according to length and diameter, in the Pine-Hardwood Region—West

D.B.H. of trees (outside bark)	Pole or pile length (feet)							Total	Percent of total
	20	25	30	35	40	45	50 or over		
	Thousand sticks								
7.0- 8.9	27,156	8,867	3,603	478	32	-	-	40,136	33.3
9.0-10.9	17,645	10,001	7,253	2,529	1,305	309	32	39,074	32.5
11.0-12.9	7,266	6,599	6,008	2,574	1,497	821	308	25,073	20.8
13.0-14.9	1,713	2,658	3,038	1,533	969	548	499	10,958	9.1
15.0-16.9	280	785	1,171	655	471	281	329	3,972	3.3
17.0-18.9	25	199	346	242	178	111	136	1,237	1.0
Total	54,085	29,109	21,419	8,011	4,452	2,070	1,304	120,450	100.0
Percent of total	44.9	24.2	17.8	6.6	3.7	1.7	1.1	100.0	

Table 4. -- Total number of pine poles or piles, classified according to length and diameter, in Texas Unit #1

D.B.H. of trees (outside bark)	Pole or pile length (feet)							Total	Percent of total
	20	25	30	35	40	45	50 or over		
	Thousand sticks								
7.0- 8.9	7,612	2,521	961	78	-	-	-	11,172	31.8
9.0-10.9	5,194	2,783	1,998	777	219	75	-	11,046	31.4
11.0-12.9	2,360	1,938	1,547	833	369	263	63	7,373	21.0
13.0-14.9	704	952	770	501	279	182	175	3,563	10.1
15.0-16.9	132	369	294	254	178	100	138	1,465	4.2
17.0-18.9	3	113	94	106	88	50	78	532	1.5
Total	16,005	8,676	5,664	2,549	1,133	670	454	35,151	100.0
Percent of total	45.5	24.7	16.1	7.3	3.2	1.9	1.3	100.0	

Table 5. -- Total number of pine poles or piles, classified according to length and diameter, in Texas Unit #2

D.B.H. of trees (outside bark)	Pole or pile length (feet)							Total	Percent of total
	20	25	30	35	40	45	50 or over		
	Thousand sticks								
7.0- 8.9	2,758	1,083	606	81	-	-	-	4,528	35.4
9.0-10.9	1,571	1,265	871	334	306	38	-	4,385	34.2
11.0-12.9	518	725	662	331	219	106	44	2,605	20.3
13.0-14.9	91	222	315	153	128	46	38	993	7.8
15.0-16.9	3	37	94	47	44	16	12	253	2.0
17.0-18.9	-	-	22	10	9	3	-	44	.3
Total	4,941	3,332	2,570	956	706	209	94	12,808	100.0
Percent of total	38.6	26.0	20.1	7.5	5.5	1.6	0.7	100.0	

Table 6. -- Total number of pine poles or piles, classified according to length and diameter, in Louisiana Unit #3

D.B.H. of trees (outside bark)	Pole or pile length (feet)							Total	Percent of total
	20	25	30	35	40	45	50 or over		
	Thousand sticks								
7.0- 8.9	1,884	542	361	20	-	-	-	2,807	30.4
9.0-10.9	1,368	616	614	150	146	-	-	2,894	31.3
11.0-12.9	728	458	508	164	97	69	28	2,052	22.2
13.0-14.9	263	228	282	86	45	39	45	988	10.7
15.0-16.9	83	91	117	43	18	11	24	387	4.2
17.0-18.9	22	27	34	16	4	3	6	112	1.2
Total	4,348	1,962	1,916	479	310	122	103	9,240	100.0
Percent of total	47.1	21.2	20.7	5.2	3.4	1.3	1.1	100.0	

Table 7. -- Total number of pine poles or piles, classified according to length and diameter, in Louisiana Unit #5

D.B.H. of trees (outside bark)	Pole or pile length (feet)							Total	Percent of total
	20	25	30	35	40	45	50 or over		
	Thousand sticks								
7.0- 8.9	3,782	1,073	489	87	-	-	-	5,431	33.6
9.0-10.9	1,832	1,263	1,105	479	257	196	32	5,164	31.9
11.0-12.9	623	746	932	422	241	196	144	3,304	20.4
13.0-14.9	122	289	507	219	145	102	103	1,487	9.2
15.0-16.9	10	84	235	95	61	42	45	572	3.5
17.0-18.9	-	16	103	38	29	16	23	225	1.4
Total	6,369	3,471	3,371	1,340	733	552	347	16,183	100.0
Percent of total	39.4	21.5	20.8	8.3	4.5	3.4	2.1	100.0	

Table 8. -- Total number of pine poles or piles, classified according to length and diameter, in Arkansas Unit #3

D.B.H. of trees (outside bark)	Pole or pile length (feet)							Total	Percent of total
	20	25	30	35	40	45	50 or over		
	Thousand sticks								
7.0- 8.9	5,494	2,676	625	148	32	-	-	8,975	32.8
9.0-10.9	3,681	2,798	1,862	654	325	-	-	9,320	34.0
11.0-12.9	1,324	1,356	1,570	564	377	187	29	5,407	19.7
13.0-14.9	338	438	857	361	287	148	138	2,567	9.4
15.0-16.9	32	74	303	151	158	106	110	934	3.4
17.0-18.9	-	-	26	45	48	39	29	187	.7
Total	10,869	7,342	5,243	1,923	1,227	480	306	27,390	100.0
Percent of total	39.7	26.8	19.1	7.0	4.5	1.8	1.1	100.0	

Table 9. -- Total number of pine poles or piles, classified according to length and diameter, in Arkansas Unit #4

D.B.H. of trees (outside bark)	Pole or pile length (feet)							Total	Percent of total
	20	25	30	35	40	45	50 or over		
	Thousand sticks								
7.0- 8.9	5,007	835	513	64	-	-	-	6,419	40.9
9.0-10.9	3,335	991	729	104	52	-	-	5,211	33.2
11.0-12.9	1,226	967	645	194	194	-	-	3,226	20.6
13.0-14.9	77	246	178	155	85	31	-	772	4.9
15.0-16.9	-	1	26	23	12	6	-	68	.4
17.0-18.9	-	-	-	-	-	-	-	-	-
Total	9,645	3,040	2,091	540	343	37	-	15,696	100.0
Percent of total	61.5	19.4	13.3	3.4	2.2	.2	-	100.0	

Table 10. -- Total number of pine poles or piles, classified according to length and diameter, in Oklahoma Unit #1

D.B.H. of trees (outside bark)	Pole or pile length (feet)							Total	Percent of total
	20	25	30	35	40	45	50 or over		
	Thousand sticks								
7.0- 8.9	619	137	48	-	-	-	-	804	20.2
9.0-10.9	664	285	74	31	-	-	-	1,054	26.5
11.0-12.9	487	409	144	66	-	-	-	1,106	27.8
13.0-14.9	118	283	129	58	-	-	-	588	14.7
15.0-16.9	20	129	102	42	-	-	-	293	7.4
17.0-18.9	-	43	67	27	-	-	-	137	3.4
Total	1,908	1,286	564	224	-	-	-	3,982	100.0
Percent of total	47.9	32.3	14.2	5.6	-	-	-	100.0	

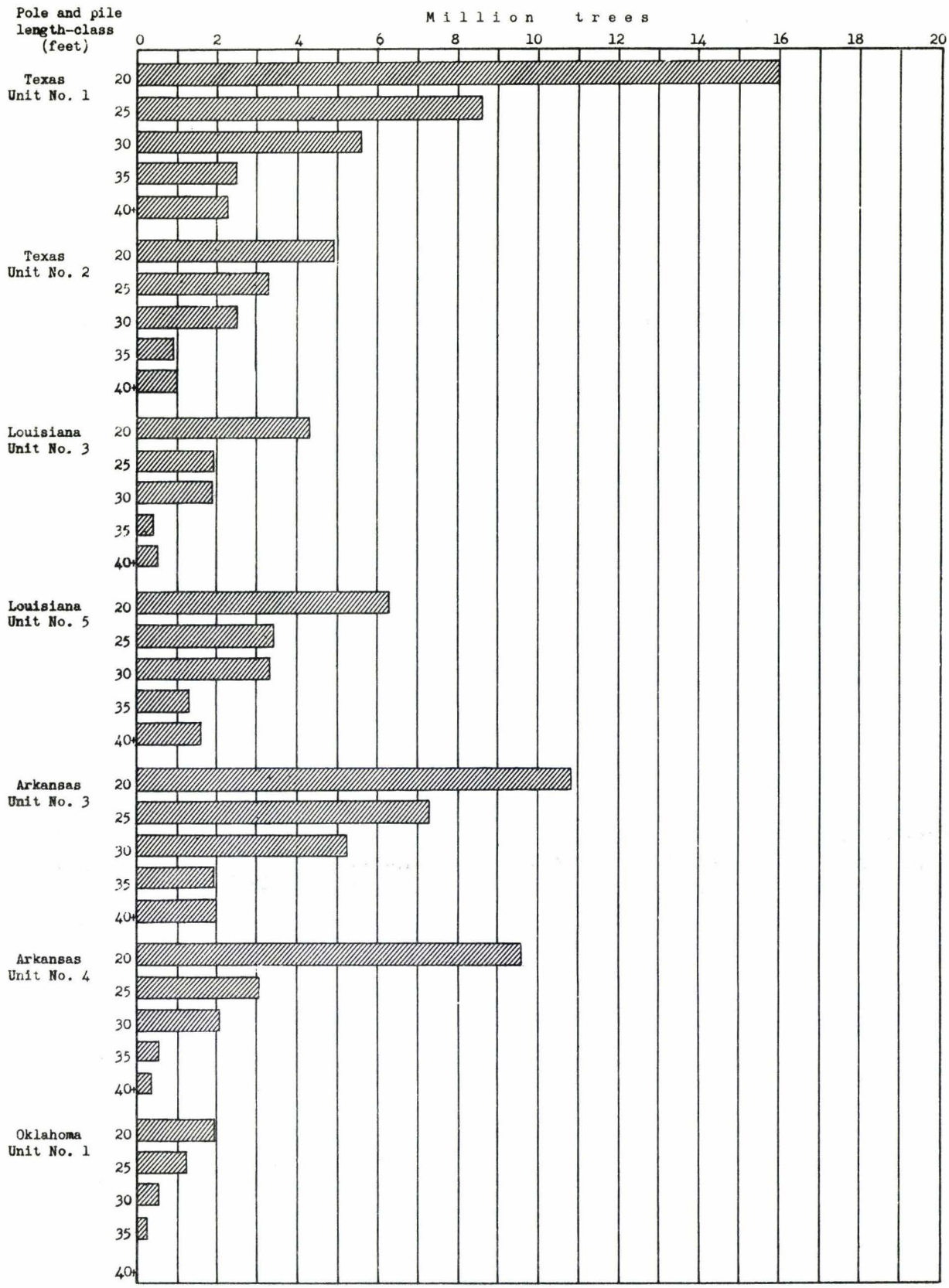

Figure 2. - Number of trees in each survey unit classified according to pole and pile length-class

Production of Poles and Piles

During 1935 in the Pine-Hardwood Region—West approximately 516,000 pine poles and piles were produced, with a total volume of 6,770,000 cubic feet, as shown in table 11. These estimates are based upon a canvass of all known users or purchasers of pine poles or piles from this area, and represent actual responses from at least 90 percent of them.

Table 11. -- Estimated production of pine poles and piles in the Pine-Hardwood Region—West, 1935

Unit	Number of poles and piles	Cubic feet (inside bark)
Texas #1	144,000	1,310,000
Texas #2	50,000	630,000
Louisiana #3	119,000	1,370,000
Louisiana #5	99,000	1,530,000
Arkansas #3	71,000	1,490,000
Arkansas #4	22,000	420,000
Oklahoma #1	11,000	20,000
Total	516,000	6,770,000

Summary

The seven Survey units which make up the Pine-Hardwood Region—West contain 48 million acres, of which 31 million are forested. Longleaf types occupy about 9 percent of the forest area, shortleaf-loblolly 34 percent, shortleaf-loblolly-hardwoods 24 percent, upland hardwoods 17 percent, and bottomland hardwoods 16 percent.

In this area occur over 120 million trees that were considered suitable for poles and piles by the Survey estimators. Sixty-nine percent of these will produce poles and piles in the 20- and 25-foot length-classes, and slightly over 24 percent will produce 30- and 35-foot lengths, while not quite 7 percent will produce poles or piles 40 feet or over in length. The number of poles per acre is greatest in Texas Unit #1 and least in Oklahoma Unit #1.

The sawmill industry is at present the chief competitor for pole and pile timber, but with the increasing development of the pulp industry more of the smaller pole trees will be converted into pulp.

To insure a continuing supply of pole and pile timber, the industry should endeavor to cooperate with the lumber companies, pulp companies, and farm owners. If the farmers, who own nearly 8 million acres of forested land in small tracts, could be convinced of the superior profits to be obtained from reserving their better trees for poles, an immense supply of pole and pile timber would be assured. Since a 12-inch pine tree (which will make a 40-foot pole) has, at prevailing prices, a stumpage value of about 40¢ as a pole, about 30¢ as lumber, and only 14¢ as pulpwood, farmers, lumber companies, and pulpwood operators should consider the financial profits to be derived from marketing each tree in its most valuable form. Also, while encouraging timberland owners to sell their better trees for poles, the pole and pile producers should continue to urge consumers to use the pole and pile lengths that more nearly correspond with those indicated by the above tables to be most prevalent.